

TWENTY-FOURTH REPORT OF THE
BOARD OF ORDNANCE AND
FORTIFICATION

TO THE SECRETARY OF WAR

1914



DECEMBER 12, 1914.—Referred to the Committee on Military Affairs
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WAR DEPARTMENT,
Washington, December 11, 1914.

SIR: Pursuant to the provisions of the act of Congress approved February 24, 1891, I have the honor to transmit herewith a signed copy of the twenty-fourth annual report of the Board of Ordnance and Fortification, covering the fiscal year from July 1, 1913, to June 30, 1914.

Very respectfully,

LINDLEY M. GARRISON,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.



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REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

WASHINGTON, D. C., *October 31, 1914.*

The SECRETARY OF WAR.

SIR: Under the provisions of the act approved February 24, 1891, the Board of Ordnance and Fortification has the honor to submit, for transmission to Congress, its twenty-fourth annual report, covering the fiscal year from July 1, 1913, to June 30, 1914.

PERSONNEL.

Changes occurred in the membership of the board by the appointment, on November 7, 1913, of Hon. Francis M. Cockrell as civilian member, vice Mr. Warner; the detail, by paragraph 3, Special Orders, No. 59, March 12, 1914, of Capt. Archibald H. Sunderland, Coast Artillery Corps, vice Maj. Chamberlaine; the detail of Maj. Gen. William W. Wotherspoon, Chief of Staff, by paragraph 5, Special Orders, No. 96, April 24, 1914, vice Gen. Wood; the relief of Capt. Sunderland and detail of Col. Richmond P. Davis, Coast Artillery Corps, in his place by paragraph 14, Special Orders, No. 209, September 4, 1914, and the detail, by paragraph 15, Special Orders, No. 237, October 8, 1914, of Col. Charles G. Treat, General Staff, vice Col. Greble. Maj. William Kelly, Corps of Engineers, was detailed as recorder by paragraph 21, Special Orders, No. 183, August 6, 1914, during the absence abroad of Capt. Ralston. The board now consists of the following-named members: Maj. Gen. William W. Wotherspoon, Chief of Staff, president; Brig. Gen. William Crozier, Chief of Ordnance; Brig. Gen. E. M. Weaver, Chief of Coast Artillery; Brig. Gen. Dan C. Kingman, Chief of Engineers, Col. Charles G. Treat, General Staff; Col. Richmond P. Davis, Coast Artillery Corps; and Hon. Francis M. Cockrell, civilian member; with Capt. Robert R. Ralston, Corps of Engineers, recorder.

LEGISLATION.

The only special legislation affecting the board is contained in the fortifications appropriation act approved June 27, 1914, for continuing the work of the board, as follows:

To enable the board to make all needful and proper purchases, experiments, and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implements and engines of war, and to purchase or cause to be manufactured, under authority of the Secretary of War, such guns, carriages, armor plates, and other war material as may, in the judgment of the board, be necessary in the proper discharge of the duty devolved upon it by the act approved September twenty-second, eighteen hundred and eighty-eight; to pay the salary of the civilian member of the Board of Ordnance and Fortification provided by the act of February twenty-fourth, eighteen hundred and ninety-one, and for the necessary traveling expenses of said member when traveling on duty as contemplated in said act; for the payment of the necessary expenses of the board, including a per diem allowance to each officer detailed to serve thereon, when employed on duty away from his permanent station, of \$2.50 a day; and for the test of experimental guns, carriages, and other devices procured in accordance with the recommendation of the Board of Ordnance and Fortification, \$15,000, the expenditure of which shall be made by the several bureaus of the War Department heretofore having jurisdiction of the same, or by the board itself, as the Secretary of

War may direct: *Provided*, That before any money shall be expended in the construction or test of any gun, gun carriage, ammunition, or implements under the supervision of the said board, the board shall be satisfied after due inquiry that the Government of the United States has a lawful right to use the inventions involved in the construction of such gun, gun carriage, ammunition, or implements, or that the construction or test is made at the request of a person either having such lawful right or authorized to convey the same to the Government.

GENERAL OPERATIONS.

The statute requires the board to submit annually a statement of its general operations. Brief statements are made under appropriate headings of the objects for which allotments have been made. A useful and necessary part of the board's work has been consideration of the great number of military inventions submitted to the Government. Not a great deal of new or useful material has thus been brought to light, but all inventions have been carefully considered and such as gave promise of utility have been favorably reported upon for development or adoption. Appendix B contains a list of subjects considered.

MEANS FOR PREVENTING EROSION OF GUNS.

In January, 1908, the board made an allotment for conducting test of a method of preventing erosion proposed by Mr. J. H. Brown. Experiments were continued under varying programs and additional allotments, as set forth in previous reports, until this spring, when the tests were finally completed. Mr. Brown has, however, asked that no conclusions be drawn from the tests until he shall have had an opportunity to analyze the results. The board has granted his request, so the matter is still pending.

EMERY DISAPPEARING CARRIAGE.

In its annual reports heretofore the board has given a complete history of the Emery disappearing carriage and the various appropriations made for its construction without the Government having anything to show for the money expended. Nothing has occurred in the last year that would indicate the eventual completion and delivery of this carriage.

More than 21 years have passed since the first appropriation was made for the development of Mr. Emery's ideas in gun-carriage construction. Of the quarter million dollars appropriated there remains unexpended \$13,531.51. As all the appropriations for the Emery carriage were made by direct action of Congress and not at the suggestion of the War Department, the board refrains from making any recommendation as to the disposition to be made of the balance of funds remaining, but so far as the board is informed no action has been taken by Mr. Emery in the last five years looking to completion of his contract. The construction is under his own supervision, and he was relieved by legislation from the necessity of giving bond for performance of the contract. The only responsibility of the board is to test the carriage when completed.

MOTOR TRACTORS.

Allotments aggregating \$10,800 were made in 1913 for the purchase abroad of a motor tractor for military purposes. Consider-

able attention has been given to this subject by European Governments, but in this country practically all of the development of motor tractors has been for ordinary commercial purposes, and it was thought desirable to procure the most advanced type for test and observation in this country. Though the foreign manufacturers at first offered to sell a tractor, they finally declined to do so, but agreed to send one to the United States for test, and allotments were made on February 6 of \$3,000 and on June 5, 1914, of \$2,000 for transportation and all expenses of test of a Chatillon-Panhard tractor. Owing to the conditions abroad the manufacturers are now unable to furnish a tractor. All allotments have been revoked, and the subject will be taken up with manufacturers in this country.

MISCELLANEOUS.

Barr & Stroud portable range finder.—April 4, 1912, an allotment of \$1,000 was made for the purchase of a Barr & Stroud field artillery range finder, similar in principle to the fortress range finder manufactured by the same firm and now used in our coast defenses. The allotment was afterwards revoked, as an instrument was furnished by the manufacturers and is now under test by the Field Artillery Board.

Portable searchlight for field artillery.—October 4, 1906, the board made an allotment of \$6,500 for the development of a portable searchlight for use with the field artillery. On October 3, 1907, the allotment was increased by \$4,500 for the same purpose and to cover the expenses of test, including such alterations as experience might show to be desirable.

Development of the outfit met with many difficulties, but it was finally completed and is now in the hands of the Field Artillery Board for tactical test.

Fontanamast.—On March 2, 1911, an allotment of \$3,500 was made for the purchase of a field artillery observing platform known as the Fontanamast, a German invention. The device was tested and an unfavorable report made by the Field Artillery Board. It was then sent to the School of Fire for Field Artillery for further test.

Range-posting device.—July 2, 1912, an allotment of \$225 was made for the construction and installation of three forms of range-posting devices proposed by the Coast Artillery Board for rapid-fire batteries. The tests resulted in the adoption as a type of one form of the device for installation in all batteries where practicable.

Experimental cover for gun carriages.—Considerable trouble has been experienced at times along our northern coasts by heavy snows interfering with the operation of the disappearing gun carriages, and the board on November 7, 1912, made an allotment of \$750 for the construction of a cover that would protect the guns and carriages and at the same time permit of quick removal for use of the guns. The structure was erected, but the winter of 1912 was very mild and the few snows that fell were insufficient to determine the real value of the cover. It was therefore removed and stored for later test. On November 18, 1913, an allotment of \$300 was made to continue the test. The results were very satisfactory, but it was thought by the officers in charge of the tests that a larger cover, completely excluding snow and water from the gun pit, would be better, and on June 5, 1914, an allotment of \$1,000 was made for the construction and test of

a new and larger cover, which will be tried out during the coming winter.

Krupp 3-inch field caisson and limber.—The Ordnance Department desired to procure from abroad one of the latest designs of Krupp field-gun caissons, and on February 6, 1913, the board made an allotment of \$10,500 for the purchase of a 3-inch caisson and limber for test and comparison with similar material manufactured in this country. The caisson is now under test at Rock Island Arsenal.

Ehrhardt field caisson and limber.—January 3, 1914, an allotment of \$3,500 was made for the purchase and test of one Ehrhardt caisson and limber. The material has not yet been delivered and it is doubtful whether it will be in view of the conditions abroad.

Goerz stereoscopic telescope.—June 6, 1913, the board made an allotment of \$250 for the purchase of a Goerz stereoscopic telescope for test by the Coast Artillery Board. The report of test was unfavorable for adoption of the instrument for service use.

Photographic apparatus.—An allotment of \$500 was made on June 6, 1913, to enable the Chief Signal Officer to develop an apparatus by means of which photographs taken in the field could be enlarged for immediate use by commanders or projected on screens. The apparatus constructed was so promising that on May 1, 1914, an additional allotment of \$559 was made for the construction of two more outfits for use and test under service conditions.

Greble fuze setter.—An allotment of \$400 was made on October 6, 1913, for the development of a fuze setter proposed by Col. E. St. J. Greble, Field Artillery. January 3, 1914, the allotment was increased by \$280 to cover expenses incurred in the work. The device is now under test by the Field Artillery Board.

Leon device for submarine mines.—On July 11, 1913, an allotment of \$3,600 was made for the construction and test of submarine mines containing the Leon device for automatically controlling the depth of submergence. Tests were first undertaken at the torpedo depot at Fort Totten for the purpose of perfecting the operation of the device and will be continued at points where the depth of water and currents will determine the value of the device under service conditions.

Fallot military searchlight.—An allotment of \$350 was made on June 5, 1914, for purchase abroad and test of one Fallot portable searchlight for military use. The light has not yet been delivered.

Radio control of torpedoes.—The Radio Engineering Co. early in 1913 presented to the board a proposition for test at their own expense of an apparatus for the radio control of submarine torpedoes. To permit of tests being carried on at night the board made an allotment on May 1, 1913, of \$350 for the installation of a searchlight at the company's laboratory. The company has not yet announced its readiness to conduct formal tests of the apparatus.

Young semiautomatic shoulder rifle.—For several years experiments have been under way in the expectation of developing a satisfactory semiautomatic shoulder rifle. One of the designs submitted was that of Franklin K. Young, but the inventor was unable to finance the construction of models, and on March 6, 1913, the board made an allotment of \$1,500 for the construction of a rifle of Mr. Young's design. Models have been made of the mechanism, but the device is still in an experimental stage.

ESTIMATES.

The board has submitted to the Secretary of War for transmission to Congress an estimate for \$20,000 to carry on its work for the fiscal year ending June 30, 1916. It is recommended that the appropriation be made as heretofore in a single amount.

As will be seen from the financial statement submitted herewith, the allotments made by the board during the past year were \$26,183.60 or considerably more than the amount for which estimates have been submitted. This sum is necessary in addition to unexpended balances to meet the prospective needs of the board in order that it may satisfactorily carry on the work committed to it by Congress.

FINANCIAL STATEMENT.

On July 1, 1913, the books of the board showed a balance available of \$99,728.85. There was appropriated \$15,000 and revoked from prior allotments \$13,706.38, making a total of \$128,535.23 available. The total allotments during the year were \$26,183.60, leaving a balance of \$102,351.63 for carrying on the work of the board. These figures include a balance of \$593.39 under the act of August 18, 1890, available only for purchases abroad.

W. W. WOTHERSPOON,
Major General, Chief of Staff, President.

WILLIAM CROZIER,
Brigadier General, Chief of Ordnance.

E. M. WEAVER,
Brigadier General, Chief of Coast Artillery.

DAN C. KINGMAN,
Brigadier General, Chief of Engineers.

CHAS. G. TREAT,
Colonel, General Staff.

RICHMOND P. DAVIS,
Colonel, Coast Artillery Corps.

F. M. COCKRELL,
Civilian Member.

ROBERT R. RALSTON,
Captain, Corps of Engineers, Recorder.

APPENDIX A.

Table showing allotments made by the Board of Ordnance and Fortification from July 1, 1913, to June 30, 1914, including statement of unexpended balances.

ACT OF AUGUST 18, 1890.

1914.			
Feb.	6.	Revocation of allotment for purchase of motor tractor, made Feb. 6, 1913.....	\$593.39
		Balance available.....	<u>\$593.39</u>

ACTS OF 1892 TO 1913, INCLUSIVE.

1913.			
July	1.	Balance on hand as shown by annual report Oct. 31, 1913.....	99,728.85
1914.			
June	27.	Appropriation act.....	15,000.00
Revocations of allotments under these acts:			
Jan.	3.	Feb. 6, 1913, for armor for aeroplanes.....	47.67
		3. July 2, 1912, for range posting devices.....	21.37
Feb.	6.	Feb. 6, June, 18, and Sept. 18, 1913, for purchase of motor tractor.....	10,206.61
Apr.	3.	Mar. 2, 1911, for Fontanamast.....	1,188.00
		3. Dec. 11, 1911, for Deport field gun.....	1,724.14
		3. June 6, 1913, for Goerz telescope.....	25.00
			<u>127,941.84</u>

Allotments during the year:

1913.			
July	11.	Construction and test of Leon submarine mines.....	3,600.00
		11. Expenses of the board.....	5,000.00
Sept.	16.	Purchase abroad and test of motor tractor.....	1,800.00
Oct.	6.	Development of Greble fuse setter.....	400.00
		18. Continuation of test of gun cover.....	300.00
1914.			
Jan.	3.	Purchase and test of one Ehrhardt field limber and caisson.....	3,500.00
		3. Completion of Greble fuse setter.....	280.00
Feb.	6.	Transportation and all expenses of test of motor tractor of Chatillon-Panhard type.....	3,000.00
		6. Expenses of board.....	4,000.00
May	1.	Photographic apparatus (additional).....	559.00
June	5.	Construction and test of gun cover.....	1,000.00
		5. Purchase and test of one Fallot military searchlight..	350.00
		5. Test of Chatillon-Panhard motor tractor (additional).	2,000.00
		5. Expenses incurred in tests of means of preventing erosion.....	394.60
			<u>26,183.60</u>

Balance available July 1, 1914..... 101,758.24

RECAPITULATION.

Balance revoked, act of Aug. 18; 1890.....	593.39	
Balance available, general appropriation.....	99,728.85	
Appropriated during the year.....	15,000.00	
Allotments revoked.....	13,212.99	
		<u>128,535.23</u>
Allotments during the year.....		26,183.60
		<u>102,351.63</u>

Statement of appropriations made for experimental work of the Board of Ordnance and Fortification since its organization.

Year.	Amount.	Remarks.
1888.....	\$505,000	\$5,000 for expenses.
1889.....	231,000	\$15,000 for torpedo howitzers; \$1,000 ¹ for expenses of selection of site for proving ground; \$40,000 for counterpoise battery; \$50,000 for movable submarine torpedoes; \$125,000 ² for test of experimental guns.
1890.....	155,000	\$100,000 for purchases abroad; \$5,000 for expenses; \$50,000 for pneumatic gun carriages, segmental guns, and high explosives.
1891.....	150,000	\$5,000 was carried in the sundry civil bill to pay salary of the civilian member.
1892.....	210,000	
1893.....	125,000	\$130,000 of amounts appropriated in prior years set aside for Emery gun carriage.
1894.....	150,000	\$50,000 for pneumatic disappearing gun carriage.
1895.....	100,000	
1896.....	250,000	\$50,000 for Howell carriage; \$10,000 for Emery loading apparatus; \$40,000 for Gatling cast-steel gun.
1897.....	150,000	
1898.....	100,000	
1899.....	100,000	
1900.....	140,000	\$40,000 for Emery carriage.
1901.....	100,000	
1902.....	100,000	
1903.....	140,000	\$40,000 for Emery carriages.
1904.....	100,000	
1905.....	10,000	
1906.....	5,000	
1907.....	25,000	
1908.....	80,000	\$30,000 for Emery carriage.
1909.....	100,000	
1910.....	25,000	
1911.....	25,000	
1912.....	25,000	
1913.....	10,000	
1914.....	15,000	

¹ This sum was returned to the Treasury in 1903.

² Of this amount \$24,775 was returned to the Treasury.

APPENDIX B.

Subjects considered.

Subject.	Presented by—
Leon mine controller.....	Chief of Coast Artillery.
Battery commander's level.....	Lieut. R. E. Beebe.
Combination entrenching tool, meat can, etc.....	Capt. E. S. Sayer.
Report of test of Deport field gun.....	Field Artillery Board.
Tests of armor for aeroplanes.....	Chief of Ordnance.
Tests of armor plate and penetration of projectiles.....	Chief of Coast Artillery.
Radio control of torpedoes.....	Radio Engineering Co.
Projectile.....	W. H. Bickford.
Centrifugal gun.....	H. N. Eno.
Projectile.....	J. G. Newbury.
Explosive projectile.....	John T. Bushby.
Underwater projectile.....	Louis Kahn.
Fuse setter.....	Col. E. St. J. Greble.
Erosion tests with central ignition.....	J. H. Brown.
Deport field gun.....	Chief of Ordnance.
Davis aeroplane gun.....	Ordnance Development Co.
Moore silencer.....	F. Tennyson Neely.
Blunt-point projectile.....	W. F. Weddington.
Range finder, spark arrester, and railroad spike.....	Pvt. Joseph Sharpe.
Explosive bullet.....	J. A. M. Murphy.
Means for locating an enemy.....	Geo. Schoonover.
Subcaliber projectile.....	Daniel T. Robinson.
Projectile with expanding blades.....	Richard H. Nolan.
Double-pointed projectile.....	George J. Hothersall.
Automatic bayonet.....	J. D. Pliones and P. G. Collins.
Projectile.....	Charles B. Fox.
Armored fort.....	J. W. Moore.
Purchase of Ehrhardt limber and caisson.....	Chief of Ordnance.
Allotment for test of gun cover.....	Board of Ordnance and Fortification.
Explosive.....	Charles Arnoudts.
Recoil system for ordnance.....	O. B. Ramp.
Armor-piercing projectile.....	W. M. Douglas.
High explosive.....	W. T. Bushby.
Combination entrenching tool.....	Lieut. C. M. Maigne.
Shrapnel with explosive bullets.....	R. W. Evans.
Gun.....	A. Tevington.
Field-gun carriage.....	Giuliano Severino.
Portable shield.....	Ludwig von Wierzbicki.
Wire breaker.....	A. N. Guffney.
Submarine torpedo.....	Robert F. McGuire.
Armored automobiles.....	Chev. Louis Bruni.
Asphyxiating bomb.....	G. C. McMahon.
Steel dart.....	Wicenty Lewandowski.
Magnetic balloon.....	R. O. Frederick.
Young automatic shoulder rifle.....	S. L. Powers, attorney.
Test of motor tractor.....	Chatillon-Panhard.
Report of test of photographic apparatus.....	Chief Signal Officer.
Air rifle for gallery practice.....	E. P. Cook.
Projectile with fluted edges.....	R. H. Chappel.
Pendulum sight for small arms.....	F. Stockwald.
Report of test of gun cover.....	Col. W. E. Craighill.
Recoil pad for small arms.....	B. F. Goodrich Co.
Gasoline-engine gun.....	A. R. Blaski.
Rifle grenade.....	Wyman S. Haynes.
Cleaning thongs.....	Chas. D. Smith.
Indirect aiming of small arms.....	J. S. Schreiner.
Preventing noise in firing cannon.....	Daniel Cosner.
Allotment for additional telephoto cameras.....	Chief Signal Officer.
Adoption of type range posting devices.....	Board of Ordnance and Fortification.
Report on Hollifield practice rod for automatic pistols.....	Chief of Ordnance.
Portable shield.....	W. W. Lillard.
Catapult.....	Wm. A. Dawes.
Dirigible balloon.....	J. T. Rice.
Machine gun.....	David Danziger.
Ground mine.....	Herbert H. Cokefair.
Shell containing net.....	Milton L. Carren.
Portable shield.....	Geo. A. Nelson.
Ground mines.....	Axel G. Bergman.
Allotment for gun cover.....	Board of Ordnance and Fortification.

Subjects considered—Continued.

Subject.	Presented by—
Fallot military searchlight.....	Chief of Engineers.
Goerz stereoscopic telescope.....	Coast Artillery Board.
Projectile.....	Carlo Ricci.
Multibarrel gun.....	Alfred F. Swahn.
Centrifugal gun.....	Thos. A. Gannoe.
Bomb.....	Joseph L. Wolski.
Projectile.....	W. P. Wieman.
Bullet.....	C. August Grote.
Body armor.....	Anna M. Zier.
Submarine mine.....	W. S. Crowe and John T. Ladue.
Cleaner and lubricator.....	James J. Marshall.
Portable shield.....	J. J. Russell.
Automatic turret.....	W. Van A. Greene.
Portable shield.....	R. S. Anderson.
Final report on telephoto camera.....	Chief Signal Officer.

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